

What is Claimed is:

1. A method of formatting a signal for broadcast transmission to remote receivers comprising the steps of:

receiving a service comprising at least a first service component and a second service component each selected from the group consisting of audio, data, static images, dynamic images, paging signals, text, messages and panographic symbols, both of said first service component and said second service component being received and output by said remote receivers when said service is selected; and

generating a broadcast channel bit stream frame by appending a service control header to said service to dynamically control reception of said service at said remote receivers, said service control header comprising service control data, said service comprising an overall bit rate of K bits per second, said overall bit rate corresponding to  $n$  multiples of a minimum bit rate of L bits per second, said frame having a period of M seconds, said service having  $n \times L \times M = n \times P$  bits per frame, said frame comprising  $n \times P$  bits for said service and  $n \times Q$  bits for said service control header, wherein K,  $n$ , L, M, P and Q are numerical values, respectively;

providing said service control header with first service component control data for dynamically controlling the reception of said first service component at said remote receivers; and

providing said service control header with second service component control data for dynamically controlling reception of said second service component at said remote receivers.

2. A method as claimed in claim 1, further comprising the steps of:

dividing at least a portion of said frame into data fields; and

interleaving at least part of said first service component and said second service component into each of said data fields.

3. A method as claimed in claim 2, wherein said first service component and said second service component have a bit rate of multiples of  $L/2$  bits per second, and further comprising the step of adding padding bits to each data field when the number of said multiples of  $L/2$  bits per second is an odd number.

4. A transmission signal comprising broadcast information for broadcast transmission to remote receivers, said signal comprising a broadcast channel bit stream frame generated by appending a service control header to a service, said service comprising a plurality of service components selected from the group consisting of audio, data, static images, dynamic images, paging signals, text, messages and panographic symbols, said plurality of service components being received and output by said remote receivers when said service is selected, said service control header comprising service control data for dynamically controlling reception of respective ones of said plurality of service components at said remote receivers, said service comprising an overall bit rate of K bits per second, said overall bit rate corresponding to n multiples of a minimum bit rate of L bits per second, said frame period being M seconds, said service having  $n \times L \times M = n \times P$  bits per frame, said frame comprising  $n \times P$  bits for said service and  $n \times Q$  bits for said service control header, wherein K, n, L, M, P and Q are numerical values, respectively.

5. A transmission signal as claimed in claim 4, wherein said overall bit rate K for said service is between 16 kilobits per second and 128 kilobits per second, said minimum bit rate L for said service is 16 kilobits per second, n is an integer  $1 \leq n \leq 8$ , said frame period M is 432 milliseconds, P is 6912 and Q is 224, said frame comprising  $n \times 6912$  bits for said service and  $n \times 224$  bits for said service control header and  $n \times 7136$  total bits.

6. A transmission signal as claimed in claim 4, wherein said service comprises a first service component and a second service component, at least a portion of said frame being divided into 432 data fields which are approximately 1 millisecond in duration, each of said data fields having  $n \times 16$  bits, said first service component and said second service component being interleaved into each of said data fields.

7. A method of formatting a signal for broadcast transmission to remote receivers comprising the steps of:

receiving a service comprising at least a first service component and a second service component selected from the group consisting of digitized audio signals, analog audio signals and analog signals, both of said first service component and said second service component being received and output by said remote receivers when said service is selected;

digitizing at least said first service component if said first service component is analog;

compressing said first service component using Motion Pictures Expert Group (MPEG) source coding, said first service component being sampled at a sampling frequency which is synchronized to the bit rate of said first service component; and

generating a broadcast channel bit stream frame by appending a service control header to said service to dynamically control reception of said service at said remote receivers, said service control header comprising service control data for dynamically controlling the reception of said first service component and said second service component at said remote receivers.

8. A method as claimed in claim 7, wherein an MPEG encoder provides said source coding, and further comprising the step of synchronizing the framing operations of said MPEG encoder with said service control header, said broadcast channel bit stream frame being operable to transmit an MPEG frame generated by said MPEG encoder as a subframe thereof.

9. A method as claimed in claim 8, wherein said synchronizing step comprises the step of aligning the first bit in said first service component with the first bit of a frame header generated by said MPEG encoder.

10. A transmission signal comprising broadcast information for broadcast transmission to remote receivers, said signal comprising a broadcast channel bit stream frame generated by appending a service control header to a service, said service having at least one service component selected from the group consisting of digitized audio signals, analog audio signals and analog signals, said service component being digitized if said service component is analog and compressed using source coding selected from a group of coding schemes consisting of Motion Pictures Expert Group (MPEG) coding, MPEG 1, MPEG 2, MPEG 2.5 and MPEG 2.5, layer 3, said service control header comprising service control data for dynamically controlling reception of said service at said remote receivers, said source coding having framing operations which are synchronized with said service control header, said

broadcast channel bit stream frame being operable to transmit an MPEG coding frame generated via said source coding as a subframe thereof.

11. A method of formatting a signal for broadcast transmission to remote receivers comprising the steps of:

receiving a service comprising at least a first service component selected from the group consisting of audio, data, static images, dynamic images, paging signals, text, messages and panographic symbols; and

generating a broadcast channel bit stream frame by appending a service control header to said service to dynamically control reception of said service at said remote receivers, said service control header comprising service control header data selected from the group consisting of encryption control data, an auxiliary data field that is unrelated to any particular said service in said signal, an auxiliary field content indicator relating to the content of said auxiliary data field, data relating to multiframe in said auxiliary data field when said auxiliary data field is multiplexed, data indicating the number of service components which constitute said frame, and data for dynamically controlling reception of each of said service components at remote receivers.

12. A method as claimed in claim 11, wherein said service control header further comprises a preamble indicating the beginning of a frame, said preamble being one of a binary number and a hexadecimal number selected for effective auto-correlation to facilitate synchronization of said frame when said frame is received.

13. A method as claimed in claim 11, wherein said generating step comprises the step of dividing the overall rate of said service into a number  $n$  of multiples of a minimum bit rate of  $L$  bits per second, wherein  $n$  and  $L$  are numerical values, said bit rate index comprising one of a binary number and a hexadecimal number representing said number  $n$ .

14. A method as claimed in claim 13, wherein  $L$  is 16,000 and said overall rate of said service is  $n$  multiples of 16 kilobits per second where  $n$  is an integer  $1 \leq n \leq 8$ , said bit rate index comprising four bits with 0000 binary indicating that no valid data is being transmitted with said service and binary numbers 0001, 0010, 0011, 0100, 0101, 0110, 0111

and 1000 indicating that said overall rate of said service is 16 kilobits per second, 32 kilobits per second, 48 kilobits per second, 64 kilobits per second, 80 kilobits per second, 96 kilobits per second, 112 kilobits per second and 128 kilobits per second, respectively.

15. A method as claimed in claim 11, wherein said encryption control data comprises encryption scheme data for indicating which of a plurality of encryption schemes is being used to encrypt said service, said remote receivers being operable to use said encryption scheme data to decrypt said service.

16. A method as claimed in claim 11, further comprising the step of transmitting auxiliary data relating to said service in said auxiliary data field of service control header, said auxiliary field content indicator comprising bits to indicate that said auxiliary data is encrypted and the key used for encrypting said auxiliary data.

17. A method as claimed in claim 11, providing said service control header with bits for display on a display device connected to at least one of said remote receivers.

18. A method as claimed in claim 11, further comprising the step of providing said auxiliary data field with data relating to said service for reception at said remote receivers.

19. A transmission signal comprising broadcast information for broadcast transmission to remote receivers, said signal comprising a broadcast channel bit stream frame generated by appending a service control header to a service, said service comprising at least one service component selected from the group consisting of audio, data, static images, dynamic images, paging signals, text, messages and panographic symbols, said service control header comprising service control data for dynamically controlling reception of said service at said remote receivers on a broadcast channel, said service control header comprising service control header data selected from the group consisting of encryption control data, an auxiliary data field that is unrelated to any particular said service in said signal, an auxiliary field content indicator relating to the content of said auxiliary data field, data relating to multiframe in said auxiliary data field when said auxiliary data field is multiplexed, data indicating the number of service components which constitute said broadcast channel bit

stream frame, and data for dynamically controlling reception of each of said service components at remote receivers.

20. A transmission signal as claimed in claim 19, wherein a second broadcast channel bit stream is generated by appending a second service control header to a second service, said second service comprising at least one service component selected from the group consisting of audio, data, static images, dynamic images, paging signals, text, messages and panographic symbols, said second service control header comprising service control data for dynamically controlling reception of said second service at said remote receivers on a second broadcast channel, said service control header and said second service control header comprising data identifying which of said broadcast channel and said second broadcast channel is a primary broadcast channel and a secondary broadcast channel related to said primary broadcast channel.

21. A transmission signal as claimed in claim 19, wherein service control header and said second service control header each comprise data identifying one of local reception, regional reception and worldwide reception for said broadcast channel and said second broadcast channel, respectively.

22. A transmission signal as claimed in claim 19, wherein a second broadcast channel bit stream is generated by appending a second service control header to a second service, said second service comprising at least one service component selected from the group consisting of audio, data, static images, dynamic images, paging signals, text, messages and panographic symbols, said second service control header comprising service control data for dynamically controlling reception of said second service at said remote receivers on a second broadcast channel, said service control header and said second service control header comprising a start flag indicating when said auxiliary data field in each of said service control header and said second service control header are segments in a multiframe signal and a segment offset and length field (SOLF) indicating how many of said segments constitute said multiframe signal.

23. A method of formatting data for transmission to remote receivers comprising the steps of:

receiving broadcast channels from at least one broadcast station, each of said broadcast channels comprising a plurality of prime rate channels, each of said prime rate channels comprising a plurality of symbols;

routing each of said plurality of prime rate channels to at least one of a plurality of time division multiplexed downlinks, each of said plurality of time division multiplexed downlinks comprising a plurality of time slots;

multiplexing said symbols corresponding to each of said prime rate channels and routed to the same one of said plurality of time division multiplexed downlinks into said time slots in said same downlinks to generate a corresponding plurality of serial, time division multiplexed or TDM frame bit streams; and

appending a time slot control word to each of said TDM frame bit streams to control the recovery of said prime rate channels corresponding to a selected one of said broadcast channels by at least one of said remote receivers, said time slot control word comprising at least one field selected from the group consisting of a broadcast channel identifier type field, a broadcast channel identifier number field, a last prime rate channel flag, a format identifier field, and a broadcast audience field.

24. A transmission signal comprising broadcast information for broadcast transmission to remote receivers, said signal corresponding to one of a plurality of time division multiplexed downlinks and comprising a plurality of time slots, said time division multiplexed downlink having broadcast channels from at least one broadcast station routed thereto, each of said broadcast channels comprising a plurality of prime rate channels, each of said prime rate channels comprising symbols, said symbols corresponding to said prime rate channels routed to said time division multiplexed downlink being multiplexed in said time slots corresponding thereto to generate a serial, time division multiplexed (TDM) frame bit stream, said TDM frame bit stream comprising a time slot control word to control the recovery of said prime rate channels corresponding to a selected one of said broadcast channels by at least one of said remote receivers, said time slot control word comprising at least one field selected from the group consisting of a broadcast channel identifier type field for indicating a respective one of a plurality of geographic areas of reception for said broadcast channels, a broadcast channel identifier number field, a last prime rate channel flag, a format identifier field, and a broadcast audience field.